REMARKS

Claims 1 and 15 have been amended to delete the word "carboxy-". The amendments do not raise new issues requiring further searching or further consideration by the Examiner. Accordingly, it is respectfully requested that the Amendment be entered for consideration by the Examiner.

Turning to the art rejections, Claims 1-4, 6-12 and 14-17 stand rejected as obvious over Koch in view of Noweck. The rejection is again respectfully traversed. At the outset, Applicant would respectfully point out that in this latest rejection, the Examiner did not address new Claim 16 which is not directed to the use of polycarboxylic acids and which Applicant submits is therefore clearly patentable over any combination of Noweck and Koch. Specifically, Claim 16 contains no mention of the use of polycarboxylic acids as opposed to carboxylic acids containing an amino group, the salts thereof or their derivatives. The amendments to Claims 1, 3 and 15 likewise render the scope of those claims commensurate in scope with Claim 16 vis-à-vis the presence of carboxylic acids having carboxy groups as additional constituents.

With the proposed amendment to the claims, the teachings of Koch become irrelevant. Specifically, Koch teaches that the chelating agents are compounds containing multi-carboxylic ions or a polycarboxylic acid radical. As now amended, all independent claims exclude compounds having multi-carboxylic ions or polycarboxylic acid radicals and therefore are similar to Claim 16 previously presented. It is further to be noted that the Koch reference makes no mention of any other type of chelating agents other than those containing multi-carboxylic ions or a polycarboxylic acid radical.

It is the Examiner's position that the primary reference to Koch teaches making boehmite alumina by hydrothermal aging of aluminum alcoholate in the presence of a chelating agent comprised of an organic component containing multicarboxylate ions or polycarboxylic radical at a pH of greater than 7, preferably between 8 and 9.5. The Examiner recognizes that the Koch reference does not reach that there is any aging process performed at a temperature between 120 and 250°C. The Examiner concludes, however, that it would have been obvious to use the process of Koch including the use of a metallic or non-metallic oxide in a hydrothermal aging process requiring an aging

temperature of between 40 and 240°C in view of the Noweck reference and that the suggestion or motivation to make the combination would have been to make crystalline boehmite alumina as disclosed in column 3, lines 5-13 of Koch.

It is respectfully submitted that the Examiner has overlooked a critical teaching of the Koch reference. Specifically, Koch teaches against aging under hydrothermal conditions as set forth in all of Applicant's independent claims. In column 3, lines 56 *et seq* Koch teaches:

> "Aging the washed hydrate is substantially avoided by the chelating agent. The term "aging" as employed herein refers to the transformation of the alumina monohydrate to its trihydrate forms. Aging can be promoted under certain conditions, for instance, by maintaining the aluminum monohydrate in contact with water or allowing it to remain in its precipitated state and in contact with an aqueous medium . . . In the present invention, substantial aging of the aluminum monohydrate is avoided by contacting the aluminum monohydrate with a chelating agent . . . the aluminum monohydrate is generally not subjected to conditions which promote aging over about 12 days and preferably not over 8 days prior to drying."

It is absolutely clear from the cited lines that to achieve the goals of the Koch reference, hydrothermal aging as that term is used in connection with the limitations in Applicant's independent claims is absolutely to be avoided. Indeed, a fair reading of Koch is that hydrothermal aging as called for by Applicant's claims, would frustrate the goals of the Koch reference.

That Koch does not contemplate hydrothermal aging of the type claimed by Applicant is exemplified in Examples I-VIII of Koch where there is absolutely no teaching of hydrothermal aging as claimed by Applicant. In short, the only aging contemplated by Koch is allowing the slurry to stand for some period of time but most decidedly not at the elevated temperature ranges called for by Applicant's claims.

It is beyond peradventure that the Koch reference teaches away from hydrothermal aging. That being the case, to import into the Koch teaching the hydrothermal aging taught by Noweck would totally frustrate the teachings of the Koch reference and would vitiate the invention. Applicant submits that it is well settled law that references cannot be combined to establish a prima facie case of obviousness when the primary reference teaches away from the claimed invention and the incorporation of the teachings of the secondary reference would render the process of the primary reference inoperable for its intended purpose.

The Examiner has stated, in response to Applicant's previous argument regarding Applicant's position that the Koch and Noweck references cannot be combined, that Koch teaches that aging may occur according to two different methods, one of which calls for the adding of a chelating agent after aging to a desired hydrate distribution. The Examiner further states that the process of Koch teaches that hydrolysis of the aluminum alcoholate is performed at a temperature between 32 and 100°F. In point of fact, the Koch reference cannot realistically be considered to employ hydrothermal aging. As noted in column 2, lines 1-6 of Koch, as the hydrogel ages, the hydrate tends to be gradually transformed from the monohydrate to one or more trihydrates which as stated by Koch is disadvantageous because high trihydrate catalysts are of lower physical strength and stability. The specific lines cited by the Examiner of column 2, e.g., 19-25, basically state that if it is desired to have a stabilized amount of trihydrate, either chelating agent can be added after aging to the desired hydrate distribution or the amount of chelating agent added is less than sufficient to stop aging completely, the goal being to restrict the amount of trihydrate formed. Furthermore, as stated in column 4, lines 19 *et seq,* the chelating agent in a stabilizing amount is incorporated into the water to stabilize the monohydrate <u>against aging</u>. The entire thrust of the Koch reference is that hydrothermal aging is not only not desired but should only be used if it is desired to produce a stabilized amount of trihydrate.

This differs from Applicant's claimed invention wherein the aging is conducted at high temperatures (120°C to 250°C) for at least one hour. Furthermore, all of the independent claims call for a first step of hydrolyzing or hydrothermally aging the

mixture from the hydrolysis to the extent necessary to at least partially convert the substituted carboxylic acids into the free carboxylic acid or the dissociated form thereof, followed by a step of aging the alumina prepared thusly to an aging step of 120-250°C for at least one hour. Koch does not suggest such a two-step process and clearly does not teach to take the product which has been hydrolyzed vis-à-vis the teachings of Koch in column 4, lines 13 *et seq*, and then subject it to additional, high temperature aging. There simply is no realistic way to read the Koch reference as teaching Applicant's process wherein following hydrolysis/hydrothermal aging of the mixture resulting from the hydrolysis there is a second aging step of the boehmite aluminas produced in that first step.

With respect to the Examiner's response to Applicant's argument that Koch teaches that the pH is preferably between about 8 to 9.5, the word "about" modifies 8 not the number 9.5. Realistically the Koch reference does not teach hydrolysis greater than the pH if 9.5 while Applicant's claims specifically state that the pH is above 9.5.

It is further to be noted, that in Applicant's claimed process, the hydrolysis is conducted at higher pH values than those taught by Koch. Furthermore, with particular reference to newly added Claim 15, Applicant claims hydrolysis at a temperature of 50 to 95°C in conjunction with hydrothermal aging at a temperature of from 120 to 250°C to further distinguish, if necessary, over Koch. It is respectfully submitted that the combination of Koch and Noweck does not render Applicant's claims obvious.

Claims 1-4, 6-12 and 14-17 stand rejected as obvious over Noweck in view of Koch. Basically this is a reversal of the prior rejection in view of those two references with Noweck now being the primary reference. As to this combination, the Examiner recognizes that Noweck does not teach that the hydrolysis is carried out in the presence of a carboxylic acid and in an attempt to overcome that infirmity relies on Koch with the conclusion that it will be obvious to the skilled artisan to perform the process of Noweck using the chelating agent (carboxylic acid), etc., of Koch. The Examiner further states that the motivation for this combination would be to perform a partial aging of alumina gel containing boehmite to obtain a stabilized amount of trihydrate. This combination of references is also flawed.

To begin with, Noweck contains no teaching regarding hydrolysis of the aluminum alcoholate in the presence of substituted carboxylic acid nor for that matter does Noweck require hydrolysis at a pH value higher than 9. It is well known that unless a pH adjusting agent is added to raise the pH of the aqueous aluminum alcoholate, a pH value of greater than 9 cannot be obtained. Noweck is not concerned with the hydrolysis of aluminum alcoholate but rather special hydrothermal aging conditions for boehmite alumina. Indeed, since hydrothermal aging generally of the type claimed by Applicant is clearly contemplated by Noweck, if Koch teaches that such hydrothermal aging conditions are to be avoided, why would the skilled artisan have any reason to believe that the teachings of Koch and Noweck could be combined? Furthermore, the Examiner's suggestion/motivation of the skilled artisan vis-à-vis performing partial aging of aluminum gel containing boehmite to obtain a stabilized amount of trihydrate is not seen as being germane at all to the Noweck invention, the goal of which is to provide boehmite aluminas having unusual morphologies. Applicant is at a loss to know why obtaining stabilized amounts of trihydrate by partial aging of aluminum gel as taught by Koch, would be of any benefit in Noweck or even desirable.

The process of Koch and Noweck are totally different and any attempt to combine one with the other frustrates the teachings of both of the references. Again, Noweck expressly teaches that to achieve the benefits of the invention, long-term hydrothermal aging in the presence of water and metallic or non-metallic oxides or oxide hydrates, except for aluminum oxide or aluminum oxide hydrate is necessary. There is absolutely no suggestion in Noweck that carboxylate ions required by Koch could be employed in the Noweck process.

There is absolutely no rational basis upon which the teachings from Koch can be incorporated into Noweck or vice versa without violating the express teachings of those references.

Additionally, with respect to Claims 15 and 17, Koch and Noweck are inapposite since there is no teaching in either of those references of adding a pH adjuster to conduct the hydrolysis as opposed to simply employing the pH that results from the aluminum alcoholate water mixture.

In view of the foregoing amendments and remarks, it is respectfully submitted that all claims are in condition for allowance, which is hereby earnestly solicited and respectfully requested.

Respectfully submitted,

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